Kevin Bulthuis

Engineer in Physics

Jet Propulsion Laboratory
4800 Oak Grove Drive
Pasadena, CA 91109, USA
☎ *+1 (818) 354-7045*
✉ *kevin.m.bulthuis@jpl.nasa.gov*

Working Experience

2019 – present   **Nasa Postdoctoral Fellow**, *Jet Propulsion Laboratory/California Institute of Technology*, Sea Level and Ice (Earth Science Division).

2019 – 2020   **Teaching Assistant**, *Université de Liège*.

2015 – 2019   **F.R.S.-FNRS Research Fellow**, *Université de Liège, Computational and Stochastic Modelling (Aerospace and Mechanical Engineering) & Université Libre de Bruxelles, Laboratory of Glaciology (Department of Geosciences, Environment and Society)*.

2012 – 2015   **Student Assistant**, *Université de Liège*.

Education

2015 – 2020   **Ph.D.**, *Aerospace and Mechanical Engineering (Université de Liège) & Department of Geosciences, Environment and Societ (Université Libre de Bruxelles)*,
PhD thesis: Towards robust prediction of the dynamics of the Antarctic ice sheet: Uncertainty quantification of sea-level rise projections and grounding-line retreat with essential ice-sheet models.
http://hdl.handle.net/2268/242774

2013 – 2015   **Master's Degree in Engineering Physics**, *Université de Liège*, Summa Cum Laude,
Master's thesis: Multiphysics modeling of glacier flow: analysis and efficient numerical solution of a nonlinear coupled problem.
http://hdl.handle.net/2268/220353

2010 – 2013   **Bachelor in Engineering Science**, *Université de Liège*, Summa Cum Laude.

Research Interests

General   Ice-sheet modelling, geosciences, uncertainty quantification and stochastic analysis

Applications   Uncertainty quantification in sea-level rise projections and ice-sheet models

Publications

In review   **K. Bulthuis**, F. Pattyn, and M. Arnst. *A multifidelity quantile-based approach for confidence sets of random excursion sets with application to ice-sheet dynamics.*

Feb. 2020   E. Hanna, F. Pattyn, F. Navarro, V. Favier, H. Goelzer, M. van den Broeke, M. Vizcaino, P. Whitehouse, C. Ritz, **K. Bulthuis**, and B. Smith. *Mass balance of the ice sheets and glaciers – progress since AR5 and challenges*, Earth Science Reviews, 201, 102976, https://doi.org/10.1016/j.earscirev.2019.102976.

Apr. 2019   **K. Bulthuis**, M. Arnst, S. Sun, and F. Pattyn. *Uncertainty quantification of the multicentennial response of the Antarctic ice sheet to climate change*, The Cryosphere, 13, 1349–1380, https://doi.org/10.5194/tc-13-1349-2019.

Support and Awards

2020   NASA Postdoctoral Program (NPP) Fellowship from the Universities Space Research Association (USRA).

2015   F.R.S-FNRS Research Fellowship from the Fonds de la Recherche Scientifique (F.R.S.–FNRS) de Belgique.

2015   Best master's thesis award supported by the association of engineers from the Université de Liège.

2010   Mobility grant supported by the Fernand Pisart Foundation from the Université de Liège.

Oral communications

Jun. 2019   Contributed speaker. **K. Bulthuis**, F. Pattyn and M. Arnst. *Estimation of confidence regions for random excursion sets with application to large-scale ice-sheet simulations*, 3rd International Conference on Uncertainty Quantification in Computational Sciences and Engineering (UNCECOMP 2019), Hersonissos, Greece, `http://hdl.handle.net/2268/238637`.

Mar. 2019   Contributed speaker. **K. Bulthuis**, M. Arnst, S. Sun and F. Pattyn. *Uncertainty quantification of the multi-centennial response of the Antarctic ice sheet to climate change*, SIAM Conference on Computational and Mathematical Issues in the Geosciences (SIAMGS19), Houston, TX, `http://hdl.handle.net/2268/233442`.

Apr. 2018   Contributed speaker. **K. Bulthuis**, F. Pattyn, L. Favier and M. Arnst. *Stochastic Modeling of Uncertainties in Fast Essential Antarctic Ice Sheet Model*, SIAM Conference on Uncertainty Quantification (SIAMUQ18), Garden Grove, CA, `http://hdl.handle.net/2268/222840`.

Apr. 2017   Contributed speaker. **K. Bulthuis**, F. Pattyn, L. Favier and M. Arnst. *Uncertainty quantification of Antarctic contribution to sea-level rise using the fast Elementary Thermomechanical Ice Sheet (f.ETISh) model*, EGU General Assembly, Vienna, Austria, `http://hdl.handle.net/2268/207549`.

Sept. 2016   Contributed speaker. **K. Bulthuis**, F. Pattyn, L. Favier and M. Arnst. *Instability and abrupt changes in marine ice sheet behaviour*, 1st CRITICS Workshop and Summer School on Critical Transitions in Complex Systems, Kulhuse, Denmark, `http://hdl.handle.net/2268/201873`.

Conferences, seminars, workshops and summer school attended

Jun. 2018   *2018 Gene Golub SIAM Summer School: Inverse Problems: Systematic Integration of Data with Models under Uncertainty*, Breckenridge, CO, USA, June 12–30. **Topics include**: inverse problems, adjoint methods, and Bayesian inference.

Sept. 2017   *Summer School on Ice Sheets and Glaciers in the Climate System (Karthaus Summer School)*, Karthaus, Italy, September 12–23. **Topics include**: continuum mechanics, ice-sheet modelling, and cryosphere-climate interactions.

Jan. 2017   *Seminar on Bayesian Methods for the Physical Sciences*, Liège, Belgium, January 16–18. **Topics include**: Bayesian inference.

Aug. 2016   *1st CRITICS Workshop and Summer School on Critical Transitions in Complex Systems*, Kulhuse, Denmark, August 28–September 3. **Topics include**: bifurcation theory, dynamical systems, and stochastic differential equation.

Apr. 2016   *SIAM Conference on Uncertainty Quantification*, Lausanne, Switzerland, April 5–8, **Topics include**: uncertainty propagation, surrogate models, and sensitivity analysis.

Language skills

French   Native speaker
English   Fluent
Dutch   Good command
German   Basic communication skills